

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY

(PCT Rule 71.1)

Date of mailing  
(day/month/year)

02.02.2006

Applicant's or agent's file reference  
WO 21.1153

## IMPORTANT NOTIFICATION

International application No.  
PCT/EP2005000787

International filing date (day/month/year)  
26.01.2005

Priority date (day/month/year)  
27.01.2004

Applicant  
SERVICES PETROLIERS SCHLUMBERGER

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the International preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

## 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/B/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the International preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(3), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

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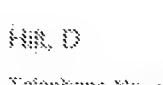
## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

## (PCT Article 36 and Rule 70)

Applicant's or agent's file reference WO 21,1183	<b>FOR FURTHER ACTION</b>		See Form PCTA/PEA/18
International application No PCT/EP2006/000787	International filing date (day/month/year) 25.01.2005	Priority date (day/month/year) 27.01.2004	
International Patent Classification (IPC) or national classification and IPC B01D17/04			
<p><b>Applicant</b>  <b>SERVICES PETROLIERS SCHLUMBERGER</b></p> <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 36 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 36(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>			
Date of submission of the demand 25.08.2006	Date of completion of this report 02.02.2006		
Name and mailing address of the international preliminary examining authority  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: 6239908 epmu 4 Fax: +49 89 2399 - 4468	Authorized Officer  Hil, D Telephone No. +49 89 2399-6577		

INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY

International application No.  
PCT/EP2005/000787

Box No. 1 Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - International preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements\* of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

Description, Pages

1-12 as originally filed

Claims, Numbers

1-16 received on 28.07.2005 with letter of 20.07.2005

Drawings, Sheets

16-34 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
- 3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (specify):
  - any table(s) related to sequence listing (specify).
- 4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (specify):
  - any table(s) related to sequence listing (specify).

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

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1. Statement

Novelty (N)	Yes: Claims	1-15
	No: Claims	
Inventive step (IS)	Yes: Claims	1-15
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations (Rule 70,7):

see separate sheet

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Box No. VIII Certain observations on the international application

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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Re Item V.

- 1 Reference is made to the following document:  
D1 : FR 2 789 059 A (HUWER INTERNATIONAL SA) 4 August 2000 (2000-08-04)
- 2 Document D1, which is considered to represent the most relevant state of the art, discloses a vessel system with a movable internal wall comprising:
  - an inflatable seal around the outer periphery of the internal wall to the internal cavity wall of the vessel;
  - a removable cap allowing when removed to open the vessel over the full section;

From this, the subject-matter of independent claim 1 differs in that the vessel system comprises a shaft traversing longitudinally the vessel, the shaft allowing to transmit a force applied on the at least one internal wall to an end of the vessel.

- 2.1 The subject-matter of claim 1 is therefore novel (Article 33(2) PCT)  
The problem to be solved by the present invention may be regarded as to simplify the supply of hydraulic or pneumatic fluid to each inflatable seal especially when the vessel is equipped with a plurality of internal walls and to maintain a fixed spacing between each internal wall.
- 2.2 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:  
No hint can be found in the available prior art that would have led the skilled man to modify the vessel system as disclosed in document D1 (by adding an internal shaft) towards a vessel system of the present invention.

3. Independent method claims 9 and 14

As apparatus claim 1 is new and non-obvious, method claims 9 and 14 for the use of that apparatus is also new and non-obvious.

4. Dependent apparatus claims 2-8;10-13;15

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Claims 2-8;10-18;15 are respectively dependent on claims 1,9 and 14 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VIII.

The application does not meet the requirements of Article 6 PCT, because claims 1,9,14 are not clear.

Claims 1,9,14 do not indicate the structural relationship between the shaft and the internal walls and the vessel, which is essential for the functioning of the vessel system: avoiding a moving of the sealed internal walls (402) relative to the vessel (401) (see para.41; fig. 4).

### Claims

- (c1) A vessel system (407) comprising:
  - a vessel (401);
  - at least one internal wall (402a; 402b; 402) located within the vessel (401);
  - at least one inflatable seal (308; 408), the inflatable seal allowing to create a seal between an outer periphery (302) of the internal wall and an internal cavity wall (310) of the vessel;
  - the vessel system being characterized in that it further comprises a shaft (412) traversing longitudinally the vessel (401).
- (c2) The vessel system of claim 1, wherein:
  - the at least one inflatable seal (308; 408) is inserted within a peripheral groove (309) of the internal wall;
  - the at least one inflatable seal (308; 408) allows to secure the internal wall (402a; 402b; 402) inside the vessel (401) when the inflatable seal is inflated, by creating a blocking seal between the outer periphery of the internal wall and the internal cavity wall; and
  - the at least one inflatable seal (308; 408) allows to remove the internal wall (402a; 402b; 402) from the vessel (401) when the inflatable seal is deflated and a grip of the seal on the internal cavity is released.
- (c3) The vessel system of claim 1 or 2, wherein the shaft (412) is hollow, the vessel system further comprising:
  - a duct (413) to supply an inflation medium to the at least one inflatable seal (308; 408), the duct being located within the shaft (412).
- (c4) The vessel system of claim 5, further comprising a programmable logic controller (416) to control a pressure of the inflation medium within the at least one inflatable seal (308; 408).

(e5) The vessel system according to anyone of claims 1 to 4, further comprising a removable cap (405) at an end of the vessel (401), the removable cap allowing when removed to open the vessel over a full section.

(e6) The vessel system according to anyone of claims 1 to 5, wherein: the shaft (412) comprises a plurality of individually detachable parts (423) which are sequentially removably mounted; the vessel system further comprising:  
a plurality of internal walls (402a; 402b; 402);  
a plurality of connectors (421), each connector allowing to connect two individually detachable parts (423) at each inter-volume (424) between two internal walls (402a; 402b; 402) so as to allow to individually remove the internal walls from the vessel (401).

(e7) The vessel system according to any one of claims 1 to 6, wherein a fluid is intended to flow through the vessel (401);  
the vessel system allows to separate a oily phase from an aqueous phase of the fluid;  
the at least one internal wall (402a; 402b; 402) supports a coalescing polymer (411).

(e8) The vessel system according to claim 7, wherein the coalescing polymer (411) allows oil droplets of the oily phase to coalesce to form large oil drops, the vessel system further comprising:  
an oil output (417) to allow to recover the large oil drops after the at least one internal wall (402a; 402b; 402).

(e9) A method for removably securing at least one internal wall (402a; 402b; 402) within a vessel (401), the method comprising:  
inflating at least one inflatable seal (308; 408) to create a seal between the at least one internal wall and an internal cavity wall (310) of the vessel;

attaching the at least one internal wall to a shaft (412), the shaft traversing longitudinally the vessel (401).

- [c10] The method of claim 9, further comprising:
  - monitoring a pressure of a medium fluid of the at least one inflatable seal (308; 408);
  - controlling the pressure of the medium fluid.
- [c11] The method according to claim 9 or claim 10, further comprising:
  - deflating the at least one inflatable seal (308; 408);
  - opening the vessel (401) over a full section;
  - removing the at least one internal wall (402a; 402b; 402) from the vessel by hoisting the shaft (412).
- [c12] The method of claim 9 wherein:
  - a fluid is intended to flow through the vessel (401);
  - the system allows to separate a oily phase from an aqueous phase of the fluid;
  - the at least one internal wall (402a; 402b; 402) supports a coalescing polymer (411).
- [c13] The method according to claim 12, wherein the coalescing polymer (411) allows oil droplets of the oily phase to coalesce to form large oil drops, the method further comprising:
  - recovering the large oil drops at an oil output (417) after the at least one internal wall (402a; 402b; 402).
- [c14] A method for dismantling a vessel system (704), wherein the vessel system comprises a vessel (401) and at least one internal wall (402a; 402b; 402) located within the vessel, the method comprising:
  - deflating at least one inflatable seal (308; 408), the at least one inflatable seal allowing to create a seal between the at least one internal wall and an internal cavity wall (310) of the vessel;

attaching the at least one internal wall to a shaft (412), the shaft traversing longitudinally the vessel (401).

[s15] The method according to claim 14, further comprising :

- disposing the vessel (401) in a vertical orientation;
- opening the vessel over a full section by removing a removable cap (405) at an end of the vessel;
- removing the at least one internal wall (402a; 402b; 402) from the vessel by hoisting the shaft (412).